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ABSTRACT

Following a discussion of the value of intuitive thought processes, this paper calls for elementary and secondary teachers to encourage intuitive thinking in addition to analytic thinking. It points out that the demand for precise, analytic answers to teacher-posed questions fosters student dependency; cites statements by Jerome Bruner about the need for children to learn inquiry methods; and advances reasons for the failure of reading educators to heed Bruner's writings. Two sample lessons for teaching inquiry/intuition techniques are then described: a readiness activity for introducing a reading selection and a reciprocal questioning exercise to help students develop questioning behaviors related to the reading of a poem. (GW)

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INTUITION TRAINING AS A COMPONENT OF READING PROGRAMMING

Robert Allan Blanc

In common with a plethora of generic concepts, "intuition" finds both mystical and pragmatic, scientific and popular definition, with referents ranging from superstition to phenomenology. Westcott (1968) identifies two separate traditions which define "intuition" very differently, with strong zeitgeist influences on changing concepts. Neither of them, psychology nor philosophy, however, encompasses the superstition with which the popular mind and popular speech surround any phenomenon which science only partially or incompletely explains. (Westcott, 22-56, passism)

Intuition, as considered in this paper, is not the trait with which a male-oriented society endows the female sector, the trait

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which contrasts with "logic" or "reason," the traits with which the dominant element invests its own thinking. Nor is intuition to be construed herein with the mystical qualities of Medieval and Eastern philosophy, the qualities which give insight into ultimate unity, true beauty, and perfect certainty. It is specifically not, therefore, the mechanism which revealed the Grail to Galahad or the Apocalypse to the prophet of Revelation.

Nor is intuition as here considered to be confused with the immediate apprehension of basic truths, without proof, without the possibility of proof. That kind of intuition was both the gift and the curse that the gods of antiquity bestowed upon Cassandra, who was both privileged to see the future and condemned to be disbelieved.

Closer to intuition in the present sense is the view of the phenomenon which allows a probable hypothesis while holding that hypothesis in abeyance, awaiting empirical validation. This mechanism revealed relativity to Einstein, calculus to Newton. Contemporary psychology, however, provides the most appropriate operational definition, seeing intuition as a special kind of inference which uses cues and associations not ordinarily used. This special kind of inference is often incapable of either explanation or verbalization. Bruner (1957, p. 67) refers to it as "going beyond the information given." Westcott (1968) attempted a definition which would allow precise investigation: "Intuition can be said to occur when an individual reaches a conclusion on the basis of less explicit information than is ordinarily required to reach that conclusion." (Westcott, p. 97)

Thus we see that intuition comes to us, distilled by centuries of thought, its meaning changed by the vicissitudes of time, reflecting

at one time the mystical bias of the middle ages, again the rationalism of the post-renaissance, and now the pragmatism of our own time. The pedigree is impressive. Considerably less impressive is the volume of research and writing on the subject in the present century. A search of ERIC, Psychological Abstracts, and Social Sciences Index reveals a scant two dozen articles on intuition in the past decade. Further search finds fewer than two dozen empirical studies in half a century.

Contemporary thought and research, although revealing a basic agreement on the nature of intuition, does not reveal unanimity in valuing intuition. Piaget, for one, acknowledges intuitive thinking as a common mode in young children. (Duckworth, pp. 1-5) Educators generally agree that the trait in young children needs harnessing, and that their uninhibited minds need the logical structure imposed by analytic thought. (Bruner, 1966, pp. 30-67, passim)

Other developmental psychologists, also with well-established credentials (Bruner among them) find intuition to be a viable, valuable thought process, highly useful in adult problem solving. (Bruner, Peters, Prince, Westcott) Bruner (Bruner and Clinchy, pp. 4-5) has added a careful distinction which delineates those situations in which analytic thinking is most appropriate from those in which intuitive thinking is appropriate. Bruner distinguished situations requiring precision from situations in which there is a tolerance for close approximation. Research pursuant to this categorization found that, as expected, analytic thinking led to a higher frequency of precisely-correct answers than did intuitive thinking. (Peters, et. al.) The range of error, however, was far greater when subjects relied on analytic thought modes than when

they relied on the intuitive mode. Thus intuitive thinking, although it lacks precision, affords a high degree of close approximation. Lest this advantage be lightly dismissed, attention is directed to a recent study (Thorslund and Martin) correlating both analytic and intuitive thought modes with academic success. Results showed a high correlation between SAT scores and analytic thinking, and that both SAT scores and analytic thinking correlate highly with academic success. A permissible inference from the research suggests that the extent to which the SAT fails as a predictor of academic success is largely the extent to which it fails to measure intuitive thinking, and that the latter factor is indeed a powerful determinant of academic success. Another inference from the study suggests that students who lack development of the intuitive mode spend hours far in excess of others in their out-of-class work in sciences, specifically physics. This conclusion offers strong support to the Bruner hypothesis that intuition has an appropriate place in intellectual disciplines in determining the first, often necessarily imprecise, move in a problem-solving sequence. (Bruner, 1971, pp. 85-87)

All the foregoing is by way of establishing a need in upper elementary and secondary schools for techniques which utilize analytic thinking where precision is necessary but which allow and encourage intuitive thinking where approximation is tolerable. An early statement by Bruner says it well:

> "It is my hunch that it is only through the exercise of problem solving and the effort of discovery that one learns the working heuristic of discovery; and, the more one has practice, the more likely is one to generalize what one has learned into a style of problem solving or inquiry that serves for any kind of task one may encounter -- or almost any kind of task. I think the matter is self-evident, but what is unclear is what kinds of training and teaching produce

> the best effects. How do we teach a child to, say, cut his losses but at the same time be persistent in trying out an idea; to risk forming an early hunch without at the same time formulating one so early and with so little evidence as to be stuck with it waiting for appropriate evidence to materialize; to pose good testable guesses that are neither too brittle nor too sinously incorrigible; and so on. Practice in inquiry, in trying to figure out things for oneself is indeed what is needed, but in what form? Of only one thing I am convinced: I have never seen anybody improve in the art and technique of inquiry by any means other than engaging in inquiry." (Bruner, 1973, pp. 410-411)

The statement, coming as it did in the mid-1950's, earned Bruner a large following among the leaders in the movement for curriculum reform; observation indicates, however, that it had little influence on classroom teacher behavior. Teachers continue to insist that students verbalize reasons for their conclusions, often forcing children into spurious explanations, seemingly analytical, when real reasons defy explication. (Bruner, 1973, p. 372) In this regard, Bruner cites the classic example of the child, when asked how many he would have left if he started with ten and gave three away, answered, "Seven." Asked how he knew, he replied, "Because five and two are seven." Or the man described by Sandburg who, when asked how he chose forty-eight, the winning number in the lottery, explained that he had seen the pictures of his grandparents on page eight of the family album, and eight times eight was forty-eight, and that was his secret. (Sandburg, The People, Yes)

The demand for precise, analytic answers, with the teacher contributing questions as students contribute answers, fosters the kind of dependency that educators see as frustrating their efforts to help students to be independent.

Physicist Robert Karplus (Science Improvement Study) said, "there are persons who grow to adulthood without attaining the capacity to think on the formal level in very many areas of experience." Karplus further observed, "...most instruction above the kindergarten takes place in what we might call the formal level. As an unfortunate consequence of this fact, many students never understand the intent of instruction and become dissatisfied with school by the time they are fourteen or sixteen." (Karplus, p. 113) Silberman, Postman, Weingarten, and a host of others have added their call for educational reform to the calls of Bruner and Conant a generation ago. Thus it comes as no news to observe that students who are independent, capable of independent judgment and of personal and academic problem solving require experience in judgment and problem solving, and yet individual lessons continue to be teacher-directed, heavily analytic, demanding of precise answers whether or not precision is appropriate to the task at hand.

In the early 1960's, Bruner stated his position again:

> "I would urge now in the spirit of an hypothesis that emphasis upon discovery in learning has precisely the effect upon the learner of leading him to be a constructionist, to organize what he is encountering in a manner not only designed to discover regularity and relatedness, but also to avoid the kind of information drift that fails to keep account of the uses to which information might have to be put. It is, if you will, a necessary condition for learning the variety of techniques of problem solving, of transforming information for better use, indeed for learning how to go about the very task of learning. Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving. So goes the hypothesis." (Bruner, 1973, p. 406)

Certainly the result of Bruner's imprecation was far short of a tidal wave of reform. With the impact of Piagetian research, Bruner's work led to the development of the SMSG math program, the new ChemStudy program, and BSCS. It also found response in Man: A Course of Study in the social sciences. In reading education, however, Bruner's call went largely unheeded, and the reasons may be relevant to the present explication. The reasons may fall into three categories of explanation: 1) the classic separation of first-rank scholars from the classroom; 2) the absorption of researchers with total programs; 3) a dichotomy between the language of research and the language of practice.

We may refer again to Bruner for the comment. In his report on the Woods Hole Conference in 1959, Bruner made the following observation:

> "The past half-century has witnessed the rise of the American university graduate school with its strong emphasis upon advanced study and research. One consequence of this development has been a growing separation of first-rank scholars and scientists from the task of presenting their own subjects in primary and secondary schools -- indeed even in elementary courses for undergraduates. The chief contact between those on the frontiers of scholarship and students in schools was through the occasional textbooks for high schools prepared by such distinguished scientists as Millikan or by historians of the stature of Beard or Commager. For the most part, however, the scholars at the forefront of their disciplines, those who might be able to make the greatest contribution to the substantive reorganization of their fields, were not involved in the development of curricula for the elementary and secondary schools. In consequence, school programs have often dealt inadequately or incorrectly with contemporary knowledge, and we have not reaped the benefits that might have come from a joining of the efforts of eminent scholars, wise and skillful teachers, and those trained in the fields related to teaching and learning. Now there appears to be a reversal of this trend. It consists in the renewed involvement of many of America's most distinguished scientists in the planning of school study programs in their field, in the preparation of textbooks and laboratory demonstrations, in the construction of films and television programs." (Bruner, 1963, pp. 3-4)

But the "trend" Bruner foresaw reminds one of the young man who introduced himself to the Connecticut Yankee as a page. "A page!" the Yankee snorted. "Why, you're hardly more than a paragraph!" And so what Bruner saw as a trend might better be read as a slight list. As with other fields, we have the textbooks. Walter Loban produced a beautiful textbook. But one textbook does not a curriculum make.

A second reason for academic non-participation in the movement for curricular reform suggests itself. Like the plumber, we aren't much better than out tools allow. And our research, bound by the constraints of statistical proof, has been occupied increasingly with the "statistically demonstrable." This leads our best researchers -- and this should imply no criticism of them -- into the necessity of simplistic definition. The exigencies of research require Carver, for instance, to define an idea as that which is expressed in 100 letter-spaces. He acknowledges, "Letting 100 letter-spaces represent a thought is a very gross and mechanical technique for estimating the Tp (number of thoughts in a passage)." (Carver, p. 25)

Researchers run a grave risk of contributing to a kind of "Double-speech," introducing their operational definitions into a language which in common parlance has not established a definitive base. Thus classroom teachers find certainty in inappropriate terms, and come to accept "comprehension" as "that which the standardized tests measure." Further, reliance grows on the Reading Guide, with its heavy emphasis on the highly directive, highly analytic format which requires a high degree of convergent thinking. The DRTA, which in science and history often takes an inquiry form, in reading education becomes highly formal, highly convergent. Beyond Reading Guides and DRTA, reading education offers little in the way of techniques to assist the classroom teacher.

A third reason for lack of inquiry/intuition training in secondary schools is the concern for total programs. Somehow, reading educators have limited their thinking to total programs. Again, this may be a result of the research bias. There is no intellectually honest way to make a statistical measurement of the effectiveness of a single lesson. A total program, however, can be instituted, controlled, tested, and validated with results statistically significant to the Nth degree. Thus we stand, to paraphrase O'Reilly, "scrimped and iced, pursuing a cautious, statistical Christ." ("In Bohemia")

This is not to say reading educators have not been active in the translation of research into programs. They have, and some programs are awesome in both concept and scope. Translated into classroom practice, however, each requires total commitment from teachers. But as has been known since long before the first-grade studies, any program can become analytic, convergent, regimented. Thus, ITA and Read in Color go the way of other comprehensive programs.

An alternative presents itself, one which has the potential for changing classroom structure short of total program revision. Reading educators have devised and published numerous techniques, single-lesson strategies, which classroom teachers may adopt, techniques which teachers can adapt to their own material. Individually, they defy statistical validation; as a genre, they may find validation. The following are submitted as exemplars of the genre of inquiry/intuition-enhancing techniques which may, as a group, bring reading education the reform so urgently sought in other disciplines.

The concept of "readiness" applies to students in advanced stages of reading as much as to beginning readers. The better the student's preparation for reading, the higher the rate of comprehension. As

often as we may repeat a readiness instruction, its meaning doesn't always register. We have, therefore, prepared a somewhat whimsical method for introducing a reading selection. It is one which we think makes students aware of how much they already know about the subject at hand, how much they can gain from listening to a brief introduction, and how much they can infer from their knowledge of literary form. The subject in this instance is George Orwell's essay, "Shooting an Elephant," and we call our readiness activity the "Feel Method." Here's how it goes, in script form:

> Announce: Today I'm going to show you a way to improve reading comprehension, the feel method. (Teacher passes out papers.) Leave the papers face down, but handle them. Feel them. The edges, the top, the bottom. When you have felt them thoroughly, put them down. Try not to look at them. (Teacher collects the papers) (Teacher passes out quiz sheets -- very informally.) Now we will have a quiz on the essay you just felt, George Orwell's "Shooting an Elephant." Has anyone read it previously? Okay, but remember -- don't give anyone an answer unless asked for one.
>
> Questions on the quiz sheet:
>
> 1. What is the name of the author of the essay?
> 2. What is the name of the essay?
> 3. What type of writing is it -- that is, short story, poem, essay, article, diary, memoir--?
> 4. What is killed in the essay?
> 5. By what means is the killing accomplished?
> 6. Who does the killing? What person?
>
> Guess at these if you don't remember. You may know more than you think.
>
> 7. In what countries or continents are elephants found in a natural environment -- I mean outside zoos and circuses?
> 8. In what country or area are elephants used for work?
> 9. Why might it become necessary to kill a working elephant?
> 10. Where might the events described by Orwell have occurred?
> 11. What was Orwell's relationship to the events -- was he an accidental observer, was he involved, was it something he heard about, or was it some-

thing he made up?

12. What densely populated country was once known as "The brightest jewel in Britain's imperial crown?"

(After students have answered or guessed at answers, it is time to check them. This is an important element of the procedure as we want to elicit all possible ideas from the group. We do it in this way --)

Who has an answer to a question, any question?

(A student raises a hand.)

Which question would you like to answer?

(The student may answer any question. Maybe #5.) After the student identifies the question he or she wishes to answer, the teacher repeats it and the student gives the answer, i.e. "The elephant was shot."

Excellent guess. You felt the essay very well. Did anyone have another answer?

(Leave the exact answer unstated, especially if there is disagreement. This is important because it removes the teacher from the role of the answer-giver).

Question #12 is included because it gets at the basic theme of the essay, imperialism. In the process of answering the question, the students may be asked, incidentally, what they know of imperialism.

By the end of the exercise, students are aware that they were guessing. They are aware of how much they know or can infer about the subject, and they are prepared for the reading. The mind-set has been established. The reading can occur with, as promised, a higher level of comprehension than would have existed had the activity not taken place.

It is necessary to discuss the activity with the students at some point. It is important that they understand that they brought much information to their reading of the essay and that the information they brought helped them to comprehend more fully.

The unstated message, clearly understood by each student, is that the student can go "beyond the information given;" in fact the student should not be rigidly bound by absolute certainty. The activity makes one small step toward freeing the student from the restrictions of analytically precise answers. (This method has previously been published in The Learning Center: A Comprehensive Model for Colleges and Universities by Martin, Lorton, Blanc, Evans; Grand Rapids, Michigan, 1977).

Reciprocal Questioning (Manzo) was designed to improve students' reading comprehension by providing an active learning situation for the development of questioning behaviors. The teacher encourages the student(s), in a specified manner, to ask questions about textual material and to set his (their) own purpose for reading. The teacher presents himself as a model of questioning behavior and helps the student to modify his questions by providing direct feedback about the student's questions. Specifically, the method as used with poetry is as follows:

1) With the observation, "This is something I think will help you to read with greater understanding," the teacher passes out copies of a poem. "in just-," by e.e. cummings has been used effectively with secondary school students.

in just-

in just-
spring when the world is mud-
luscious the little
lame balloonman

whistles far and wee

and eddieandbill come
running from marbles and
piracies and it's
spring

when the world is puddle-wonderful

the queer
old balloonman whistles
far and wee
and bettyand isabel come dancing

from hop-scotch and jumprope and

it's spring
and
the
goat-footed

balloonMan whistles

far

and

wee

--e.e. cummings

The teacher instructs as follows: "We shall read this together, silently. After you have finished reading, I shall put my paper down and you may ask me questions, the kinds of questions that teachers ask students. After you have asked all the questions you wish to ask, or all the questions you can find, I shall ask you to put your papers away and I will ask you questions fo the same sort."

2) Everyone does as the teacher has directed. Students begin to ask questions. Typically, the questions are such as "What does 'in just-' mean?" and "How can you describe the balloonman?" and "What does goat-footed mean?" and "Why is eddieandbill written that way?" The teacher answers each question as completely as possible. When the teacher speculates on uncertain answers, he gives his reasons for answering as he does, e.g., "Sometimes when words are frequently used together, as hamandeggs are for example, they seem to be almost like one word. I think that's the way it must be for Eddie and Bill, who are together so much that no one ever thinks of them separately any more but more like one unit."

3) Students run out of questions. The teacher asks questions like, "How old would you guess Eddie and Bill are?" "How old are Betty and Isabel?" "When next spring comes around, will Betty and Isabel still be together, or will they

have new partners?" "Who might the new partners be?" And so the questions can lead the students to begin to think of puberty and the springtime of life and the parallel between that springtime and the springtime of the year or of the world. As students begin to gain insight, their questions come faster--students find themselves wanting to answer other students' questions. A dialogue emerges spontaneously from the class.

4) If necessary to bring closure to the conversation, the teacher may interpose a couple of terminal questions. "Now, what would you say the poem was about?" That's guaranteed to dampen any conversation that seems going on too long. The teacher, back in the director-role, ends discussion.

As students become adept in eliciting information, their questions become increasingly insightful. The teacher's modeling is a powerful factor in generating the desired kind of questioning. Students find themselves asking questions freely, not just of the teacher, but of each other. And the well-thought question becomes the entry-ticket into the conversation. Questioning becomes a low-risk behavior, and students find their way intuitively or thoughtfully into the mainstream of the conversation. It becomes quickly apparent to even the most reticient student that any question will be treated with respect, and that the questioner need not know the answer to the question he asks.

Important for the development of inquiry/intuition are these elements: 1) the student decides his/her own level of information demand; 2) the student hypothesizes the result; 3) immediate feedback from the questions of other students and from teacher response either confirm or infirms the hypothesis; 4) infirming information allows a new hypothesis and additional questions; 5) verification against a successful student or teacher model is immediately available.

Intuition, a key element in inquiry, needs training. By giving classroom teachers model lesson strategies which aid in training of intuition and inquiry, reading educators can make a substantial contribution to curriculum reform. Accumulation of a body of such techniques may allow statistical validation which a single technique or a single lesson does not permit.

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